

18<sup>th</sup> August, 2021

## Activity-4

Objective :

To verify distributive law for three given non-empty sets A, B and C, that is,  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

Material Required:

Hardboard, white thick sheets of paper, pencil, colours, scissors, adhesive.

Method of Construction:

1. Cut five rectangular strips from a sheet of the paper and paste them on the hardboard in such a way that three of the rectangles are in horizontal line and two of the remaining rectangles are also placed horizontally in a line just below the above three rectangles. Write the symbol U in the left/right top corner of each rectangle.

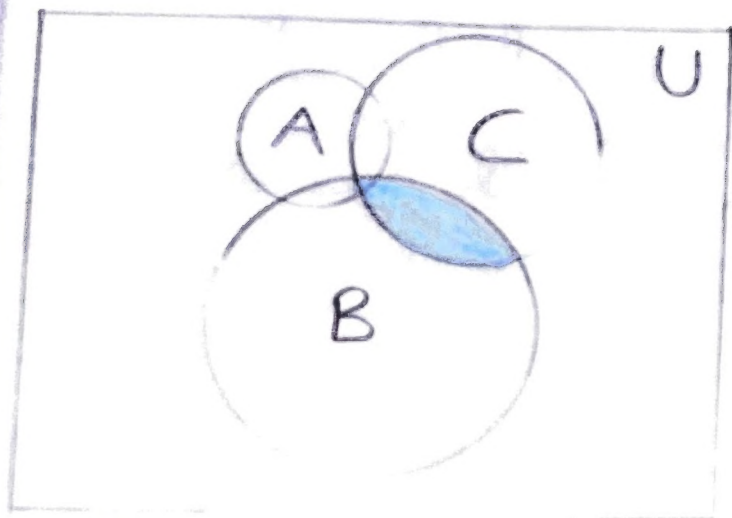


Fig. 1  $B \cap C$

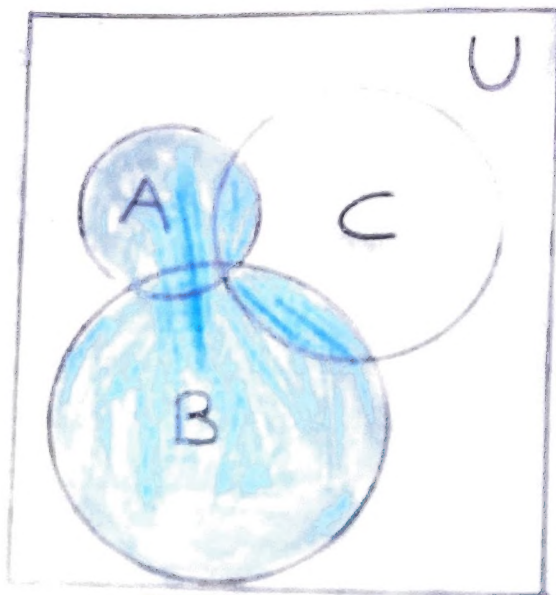


Fig. 2  $A \cup B$

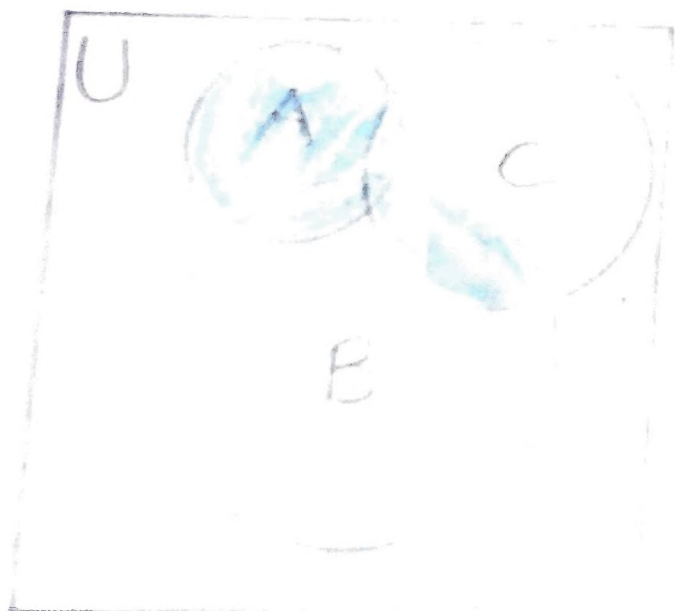


Fig. 3  $A \cup C$

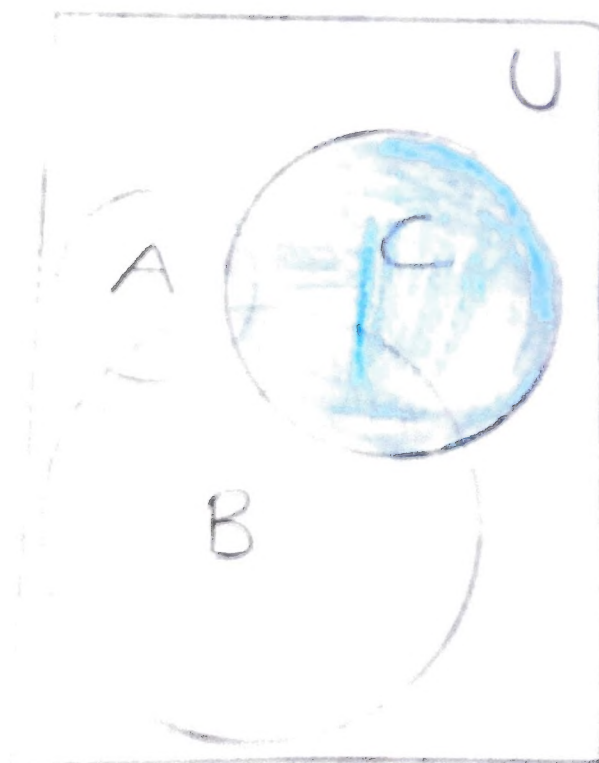


Fig. 4  $A \cup (B \cap C)$



Observation:

1. Coloured portion in Fig. 1 represents  $B \cap C$
2. Coloured portion in Fig. 2 represents  $A \cup B$
3. Coloured portion in Fig. 3 represents  $A \cup C$
4. Coloured portion in Fig. 4 represents  $A \cap (B \cup C)$
5. Coloured portion in Fig. 5 represents  $(A \cup B) \cap (A \cup C)$
6. The common coloured portions in Fig. 4 and Fig. 5 are  $A \cap (B \cap C)$
7.  $A \cap (B \cap C) = \text{Fig. 4}$

Thus, the distributive law is verified.